Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matters of	
Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5 - 29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service;	CC Docket No. 92-297 RM-7872; RM-7722
Application for Waiver of the Commission's Common Carrier Point-to-Point Microwave Radio Service Rules;	
Suite 12 Group Petition for Pioneer's Preference;	PP-22
University of Texas - Pan American Petition for Reconsideration of Pioneer's Preference Request Denial	

REPLY COMMENTS OF MOTOROLA SATELLITE COMMUNICATIONS, INC.

Michael D. Kennedy
Director, Regulatory
Relations
Motorola Inc.
1350 I Street, N.W.
Suite 400
Washington, D.C. 20005
(202) 371-6900

Philip L. Malet
Alfred M. Mamlet
Pantelis Michalopoulos
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-6239

James G. Ennis
Barry Lambergman
Fletcher Heald & Hildreth
1300 North 17th Street
11th Floor
Rosslyn, VA 22209
(703) 812-0400

Its Attorneys

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SUMMARY

Motorola Satellite Communications, Inc. ("Motorola SatCom") hereby submits its reply comments in the above-captioned proceeding. In its Notice, the Commission proposed a new co-primary allocation for the 27.5-29.5 GHz band for Local Multipoint Distribution Service ("LMDS"). The band is also allocated to the Fixed-Satellite Service (Earth-to-space) ("FSS") on a co-primary basis. As the Commission is aware, Motorola SatCom proposes to use a 200 MHz segment of this band (29.1-29.3 GHz) for gateway/control satellite uplinks in accordance with the FSS allocation. These uplinks are needed for Motorola SatCom's planned IRIDIUM™ system, a low-earth-orbiting satellite system that will provide mobile satellite service and radio determination satellite service in the United States and throughout the world.

In its Notice, the Commission noted Motorola SatCom's proposed use of the Ka-band and sought comment on "whether a separate assignment is specifically required to accommodate the proposed satellite service application in this band or whether adequate coordination and sharing criteria would be developed." Notice at ¶ 22. The Commission acknowledged that the characteristics of LMDS "may foreclose the possibility of acceptable sharing conditions between satellite and terrestrial services." Id.

In its comments, Motorola SatCom showed that co-frequency sharing between FSS and LMDS would not be possible

owing to interference between the IRIDIUM™ system's planned FSS uplinks and LMDS systems. Accordingly, Motorola SatCom urged the FCC to preclude LMDS operations from the 29.1-29.3 GHz band. This conclusion has recently been endorsed by the "MSS Above 1 GHz Negotiated Rulemaking Committee" in its Report to the

primary allocations in the 20/30 GHz bands (and compliance with any zoning or environmental requirements in urban areas) can be readily achieved, absent co-frequency LMDS operations. Moreover, among other infirmities, the GHz Equipment Company's analysis disregards the potential of interference from IRIDIUM™ earth stations to LMDS receivers, which is an important source of the interference problems identified by Motorola SatCom in its comments.

Several of the comments demonstrate that it might be wasteful to allocate two GHz to this new service, which may soon become capable of much more efficient use of the spectrum through deployment of digital technologies; therefore, a 200 MHz set-aside for IRIDIUM™ feeder uplinks would not impair the new service.

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REPLY COMMENTS OF MOTOROLA SATELLITE COMMUNICATIONS, INC.

I. INTRODUCTION

Motorola Satellite Communications, Inc. ("Motorola SatCom") hereby submits its reply comments in response to the comments filed by several parties in the above-captioned proceeding. Motorola SatCom is an interested party because its IRIDIUM™ system will use a 200 MHz segment of the 27.5-29.5 GHz ("29 GHz") band for feeder uplinks in accordance with the current co-primary allocation for Fixed-Satellite Service ("FSS").[1/] In

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[1/] These Reply Comments focus solely on FSS-related issues. For a discussion of the separate terrestrial issues raised in the Notice and addressed in the Comments, see the Comments and Reply Comments of Motorola Inc.

its comments, Motorola SatCom provided a detailed technical analysis demonstrating that the proposed allocation could not co-exist with the planned IRIDIUM™ system feeder links. Motorola SatCom therefore urged the Commission not to allocate a Local Multipoint Distribution Service ("LMDS") in the portion of the band (29.1-29.3 GHz) needed for IRIDIUM™ system feeder uplinks. Such an exclusion is supported by several commenters in this proceeding as well as the findings and recommendations of a Federal Advisory Committee convened to address MSS systems

Over a period of 3 months, members of this Committee met in formal meetings and informal working groups. One of the informal working groups devoted a substantial amount of time and attention to interference and coordination concerns affecting the 20/30 GHz bands and, in particular, the planned use by Motorola SatCom of the 29.1-29.3 GHz band for IRIDIUM™ system feeder links. The Committee reviewed technical inputs from its members and ultimately reached consensus on a series of recommendations relating to the use of those bands by MSS operators. These recommendations, along with the supporting analysis, are contained in the Report of the MSS Above 1 GHz Negotiated Rulemaking Committee to the Commission, dated April 6, 1993.[3/]

In its final Report, the Federal Advisory Committee determined that an LMDS primary allocation would be incompatible with operation of the IRIDIUM™ system feeder uplinks in the 29.1-29.3 GHz band, and recommended no new LMDS allocation in this 200 MHz band. These conclusions are consistent with the comments made by Motorola SatCom in this proceeding. The Commission should not allocate a new primary service in a band when it cannot coexist with an existing primary allocation.

III. COMMENTS FILED BY THE SATELLITE COMMUNITY DEMONSTRATE THE NEED TO ENSURE THE CONTINUED AVAILABILITY OF THE 29 GHZ BAND FOR FSS SYSTEMS

A number of satellite interests filed comments alerting the Commission to the needs of FSS operators and the problems of

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[3/] Motorola SatCom understands that relevant portions of this Report will be transmitted to the Commission for entry and docketing in this proceeding.

co-frequency sharing between FSS and LMDS. These commenters generally emphasize the fact that the 29 GHz band was intended to be an expansion band for the FSS and that, as expected, use of the band by the FSS is beginning to emerge as the lower FSS bands become increasingly saturated. Consequently, these commenters ask the Commission to ensure that the future needs of FSS systems are adequately accommodated.[4/] Indeed, NASA asks the Commission to defer for five years a decision on whether to allocate spectrum in the 29 GHz band for LMDS so that it can properly weigh the impact on the FSS in light of the results of NASA's Advanced Communications Technology Satellite program. Similarly, Loral Qualcomm, another LEO MSS applicant, urges postponement of a decision on an LMDS allocation until further studies are conducted and the feeder link needs of MSS applicants are satisfied. Hughes argues that LMDS proponents should at a minimum be required to make a detailed technical showing that adequate sharing and coordination criteria can be adopted before the spectrum is allocated to LMDS.

A number of satellite industry commenters further contend that the needs of the FSS can best be protected by excluding LMDS from at least a portion of the 29 GHz band. For example, Norris Satellite Communications, Inc. ("Norris") urges that only 1 GHz in the "A-band" should be allocated to LMDS. Calling Communications, Inc. seeks secondary status for LMDS and

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4/ See, e.g., Comments of Hughes Space and Communications Company ("Hughes") at 3; Comments of Loral Qualcomm Satellite Services, Inc. ("Loral Qualcomm") at 3.

imposition of EIRP limits, or alternatively a set-aside of 1,000 MHz for FSS.

Motorola SatCom is sympathetic to the concerns voiced by the satellite community. These concerns moreover suggest that the 200 MHz needed by Motorola SatCom for the IRIDIUM™ system feeder links would not suffice to accommodate the needs of other satellite systems, including the feeder link requirements of other proposed LEO MSS systems. Accordingly, if the Commission decides to take into account all of these potential FSS spectrum demands, LMDS operations could not be allocated for a much larger bandwidth than the 29.1-29.3 GHz band requested by Motorola SatCom.

In any event, Motorola SatCom believes that it is entirely appropriate for the Commission to take into account the specific needs of the IRIDIUM™ system in the 29 GHz band and accordingly provide for 200 MHz of spectrum to accommodate those needs. Indeed, of all LEO MSS applicants, only Motorola SatCom has communicated to the FCC its intention to use spectrum in the 27.5-29.5 GHz band for its feeder links. With the exception of Loral Qualcomm, Motorola SatCom is also the only LEO MSS applicant that has filed comments in this proceeding.

Significantly, as stated above, the Report of the Federal Advisory Committee, whose composition included all MSS applicants, endorsed Motorola SatCom's conclusion that LMDS would be incompatible with the IRIDIUM™ feeder uplinks, and proposed that LMDS should be excluded from the 200 MHz proposed to be used by the IRIDIUM™ system.

IV. COMMENTS FILED BY LMDS PROPONENTS EITHER EVADE OR MISCHARACTERIZE THE ISSUE OF LMDS COMPATIBILITY WITH FSS SYSTEMS

A. Suite 12 Erroneously Argues that LMDS Would Not Pose Additional Interference and Coordination Problems for FSS Operators

Suite 12 argues, without any technical support or analysis, that the Commission need not be concerned with co-frequency sharing between LMDS and FSS systems because the existing widespread licensing of terrestrial microwave systems in the downlink portion of the Ka-band (i.e., 17.7-19.7 Ghz) make it virtually impossible for FSS earth stations to be located in urban areas where LMDS systems will be located. Noting the growing congestion of terrestrial microwave systems and FSS earth stations in the C-band, Suite 12 asserts that "it has always been

In fact, such coordination in urban areas has been undertaken with success on numerous occasions pursuant to the current Part 25 rules. Moreover, Working Group 3 (Feeder and Intersatellite Links) of the Federal Advisory Committee recently noted that coordination of FSS systems with both point-to-point and point-to-multipoint systems in urban areas is feasible.[6/] Indeed, the large number of C-band earth stations licensed in the United States demonstrate that FSS earth stations can co-exist with point-to-point microwave systems in metropolitan areas.

Second, as noted in Section III, the FSS allocations in the Ka-band were intended to accommodate the expansion of FSS as the lower FSS bands become saturated with users. Thus, the Ka-band FSS allocations were partly designed to address precisely the problem now arising from the proliferation of microwave-

Fourth, Suite 12 ignores the fact that coordination with terrestrial microwave systems in the Ka-band will be significantly easier than coordination with LMDS systems: all of the existing microwave systems have narrow-beam low-sidelobe antennas complying with 47 C.F.R. § 21.108(c) and are point-to-point, in contrast with the broad beam and point-to-multipoint nature of LMDS. In addition, the existing point-to-point

As for Suite 12's other claims, Motorola SatCom is confident that it will be able to locate IRIDIUM™ earth stations in or near metropolitan areas in compliance with any applicable environmental and zoning regulations. These earth stations will be relatively small in size -- about 3 meters in antenna diameter. Therefore, the IRIDIUM™ earth stations will be no different -- indeed, they will be smaller and less obtrusive -- than a myriad of earth stations that operate in metropolitan areas, uninhibited by local environmental and zoning require-

primary status (along with FSS).[8/] This proposed allocation could create additional coordination problems for FSS. Moreover, switching feeder links frequencies at this juncture would require substantial redesign of the IRIDIUM™ system and add significantly to the costs of the system. The 29.1-29.3 GHz band was carefully chosen by Motorola SatCom because of its worldwide availability and in reliance on an existing primary allocation.[9/]

B. The GHz Equipment Company is Wrong in Its Assessment That There Are No Genuine Interference Concerns Between the IRIDIUM™ System and LMDS

The GHz Equipment Company discusses interference between the IRIDIUM™ system and LMDS, and concludes that the IRIDIUM™ system would not raise genuine interference concerns for LMDS operators. It further states that "[i]n the unlikely event that some objectionable interference persisted notwithstanding the parties' efforts to resolve the problem, the offending terrestrial user could be required to discontinue its use of that portion of the band." GHz Equipment Company Comments at 4. It also recommends that the IRIDIUM™ system be assigned the "center"

[8/] See Notice of Proposed Rulemaking In the Matter of Amendment of Section 2.106 of the Commission's Rules to Upgrade to Primary Status the Secondary Mobile-Satellite Service Allocation at 19.7-20.2 GHz and 29.5-30.0 GHz, 7 F.C.C. Rcd 5626 (1992).

[9/] In this regard, M3 Illinois Telecommunications Corp. also incorrectly asserts that the reassignment of spectrum outside the 27.5-29.5 GHz band to pending FSS applicants would only cause minimal inconvenience to these applicants. As indicated above, the "inconvenience" to Motorola SatCom of such a change would be significant, as the change would require a substantial redesign of the IRIDIUM™ system.

of the A- and B-Bands, so that the two LMDS licensees can share equally in accommodating satellite operations.

The GHz Equipment Company, however, has incorrectly confined its analysis to interference to the IRIDIUM™ satellites from LMDS transmitters and interference to LMDS receivers from IRIDIUM™ satellites (from the reflection of LMDS signal paths). It does not address interference into LMDS receivers from the IRIDIUM™ system gateways. Yet, as Motorola SatCom explained in its comments, it is precisely the potential for interference from the IRIDIUM™ system earth stations to the LMDS interactive and one-way links that raises the most serious concerns.

In addition, the contention of the GHz Equipment Company that there would be no interference to the IRIDIUM™ satellite receivers is also incorrect. As shown in the Technical Appendix accompanying Motorola SatCom's comments, if Suite 12 and an IRIDIUM™ system earth station were located in the same metropolitan area, the Suite 12 network of hub stations would add a measurable amount of interference noise into the IRIDIUM™ satellites operating in the same band.

As for the suggestion that the IRIDIUM™ uplinks should be assigned the center of the A- and B-bands, Motorola SatCom has already noted that changing the system's frequency plan at this juncture has costs and consequences that render such an option unviable.

V. THE FLEXIBILITY SAID TO BE REQUIRED FOR LMDS MAKES A SEPARATE ALLOCATION FOR IRIDIUM™ SYSTEM FEEDER UPLINKS EVEN MORE IMPERATIVE

Several commenters caution the FCC to allow potential LMDS licensees as much flexibility as possible to design their systems and not to lock in on a particular technology. See e.g. GTE Comments at 6. In this regard, they ask the Commission to establish only the minimum technical standards necessary to control interference, and leave the development of any more specific standards to industry fora.

While such technological flexibility may be desirable for the development of LMDS, it provides further support for an exclusive FSS allocation. Motorola SatCom's interference analysis was based solely on data provided by Suite 12. If significant changes are made to LMDS system design characteristics, additional interference and coordination problems may result.

In this regard, Motorola SatCom also notes that the rules proposed by the Commission in the Notice already give LMDS operators considerable flexibility. In particular, the proposed rule on frequency coordination (Rule § 21.1002(b)) is limited in scope and only covers coordination between adjacent LMDS providers, not inter-service coordination. As this limited

VI. LMDS LICENSEES DO NOT NEED 2 GHz OF SPECTRUM TO PROVIDE SERVICE

Several commenters point out that the proposed subdivision of each 1 GHz band into channels of 20 MHz is based on the analog technology employed by Suite 12. These commenters note the possibility of future digital LMDS technologies that will be capable of accommodating more closely-spaced channels, each occupying much less than 20 MHz. Thus, Wireless Cable, Ltd. suggests that the LMDS rules "should require a minimum of 49 broadcast channels with a maximum bandwidth of 20 MHz per channel." See Comments of Wireless Cable, Ltd. at 2 (emphasis in original), Comments of Senvista General Partnership at 2. Moreover, Motorola Inc. (the parent company of Motorola SatCom) observes that future modulation technologies may permit an LMDS licensee to provide some of the planned services within a 250 MHz bandwidth, in which case a total LMDS allocation of 500 MHz would suffice. See Comments of Motorola Inc. at 7. Norris cites to the Suite 12 analysis (Appendix B of Suite 12's Petition for Rulemaking) for the estimate that 1000 MHz should be capable of supporting up to 664 high-quality digital channels.

In view of the spectral efficiency expected to be attained by digital LMDS technologies, the allocation of 2,000 MHz on the basis of the needs of an analog system would appear to be overly generous and wasteful. Thus, the failure to allocate a 200 MHz or larger bandwidth to LMDS should still leave ample spectrum for LMDS systems to be competitive with other video distribution modes.

VII. CONCLUSION

For the foregoing reasons, if the Commission otherwise concludes that an LMDS allocation is in the public interest, it should not allocate this new service to the 29.1-29.3 GHz band in order for the IRIDIUM™ system to operate its feeder links.

Respectfully submitted,

MOTOROLA SATELLITE COMMUNICATIONS, INC.

Michael D. Kennedy
Director, Regulatory Relations
Motorola Inc.
1350 I Street, N.W.
Suite 400
Washington, D.C. 20005
(202) 371-6900

Philip L. Malet
Alfred M. Mamlet
Pantelis Michalopoulos
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-6239

James G. Ennis
Barry Lambergman
Fletcher Heald & Hildreth
1300 North 17th Street
11th Floor
Rosslyn, VA 22209
(703) 812-0400

Its Attorneys

April 15, 1993

CERTIFICATE OF SERVICE

I, Pantelis Michalopoulos, hereby certify that the foregoing Reply Comments of Motorola Satellite Communications, Inc. were served by first-class mail, postage prepaid, this 15th day of April, 1993 on the following persons:

Henry M. Rivera
Larry S. Solomon
Ginsburg, Feldman and Bress, Chartered
1250 Connecticut Ave., N.W.
Suite 800
Washington, DC 20036

(Counsel for Suite 12 Group)

Edward R. Wholl
Katherine S. Abrams
2000 Corporate Drive
Orangeburg, NY 10962

(Counsel for NYNEX Mobile Communications Company)

Robert Giddings
The University of Texas System
Office of the General Counsel
201 West Seventh Street
Austin, TX 78701-2981

Daniel L. Bart
1850 M Street, N.W.
Suite 1200
Washington, DC 20036

(Counsel for GTE Service Corporation)

Dr. Daniel Niemeyer, Director
Academic Media Services
University of Colorado at Boulder
360 Stadium, Gate 11
Campus Box 379
Boulder, CO 80309-0379

William L. Roughton, Jr.
1310 N. Courthouse Road
Arlington, VA 22201

(Counsel for Bell Atlantic Personal Communications, Inc.)

Perry W. Haddon
1000 Ainsworth Suite 310
Prescott, AZ 86301-1667

Michael D. Kennedy
Michael A. Menius
Motorola Inc.
Government Relations Office
1350 I Street, N.W.

[redacted]

Raymond A. Linsenmayer
The United States
Interactive and Microwave
Television Association
2300 M Street, N.W.
Suite 800
Washington, DC 20037

Ronald D. Maines
Maines & Harshman, Chrtd.
2300 M Street, N.W.
Suite 900
Washington, DC 20037

(Counsel for Sonvista General

and

James L. Wurtz
1275 Pennsylvania Ave., N.W.
Washington, DC 20004

(Counsel for Pacific Telesis Group; Pacific Bell; Nevada Bell)

Josephine S. Trubek
General Counsel
Rochester Telephone
Corporation
180 South Clinton Avenue

Howard J. Barr
Pepper & Corazzini
200 Montgomery Building
1776 K Street, N.W.
Washington, DC 20006

(Counsel for Caribbean Communications Corp. d/b/a/ St. Thomas - St. John Cable TV)

Paul J. Sinderbrand
Dawn G. Alexander
Sinderbrand & Alexander
888 Sixteenth Street, N.W.
Suite 610
Washington, DC 20006-4103

(Counsel for The Wireless Cable Association International, Inc.)

Robert B. McKenna
1020 19th Street, N.W.
Suite 700
Washington, DC 20036

(Counsel for U S WEST, INC.)

Linda Shea Gieseler
Farrow, Schildhause & Wilson
1400 16th Street, N.W.
Suite 501
Washington, DC 20036

(Counsel for Competitive Cable Association)

Jay C. Keithley
Phyllis A. Whitten
1850 M Street, N.W.
Suite 1100
Washington, DC 20036

and

Craig T. Smith
P.O. Box 11315
Kansas City, MO 64112

(Counsel for Sprint Corporation)

Joseph D. Carney
Joseph D. Carney & Associates
18680 Rivercliff Drive
Fairview Park, OH 44126

Michael B. Wiggen
M3 Illinois Telecommunications Corp.
963 Ventura Drive
Palatine, IL 60067

Richard S. Wilensky
Middleberg, Riddle & Gianna
2323 Bryan Street
Suite 1600
Dallas, TX 75201

(Counsel for Cellular Television Associates, Inc.)

Richard West
Associate Vice President
Information Systems and Administrative Services
University of California
Office of the President
300 Lakeside Drive
Oakland, CA 94612-3550

John W. Hunter
McNair Law Firm, P.A.
1155 Fifteenth Street, N.W.
Washington, DC 20005

(Counsel for Rock Hill Telephone Company; Fort Mill Telephone Company; Lancaster Telephone Company)

George Y. Wheeler
Koteen & Naftalin
1150 Connecticut Avenue, N.W.
Suite 1000
Washington, DC 20036

(Counsel for Telephone and Data Systems, Inc.)

Marilyn Mohrman-Gillis
General Counsel
Association of America's Public Television Stations
1350 Connecticut Avenue, N.W.
Suite 200
Washington, DC 20036

Paula A. Jameson
Gregory Ferenbach
Public Broadcasting Service
1320 Braddock Place
Alexandria, VA 22314

Jack McBride
Organization of State Broadcasting Executives
939 South Stadium Road
Columbia, SC 29201

John Robert Curtin
Southern Educational Communications Association
939 South Stadium Road
Columbia, SC 29201

William B. Barfield
Thompson T. Rawls II
Suite 1800
1155 Peachtree Street, N.E.
Atlanta, GA 30367-6000

(Counsel for Bellsouth Corporation; Bellsouth Telecommunications, Inc.; Bellsouth Enterprises, Inc.)

Martin T. McCue
Anna Lim
United States Telephone Association
900 19th Street, N.W.
Suite 800
Washington, DC 20006-2105

Michael R. Gardner
David Jeppsen
The Law Offices of Michael R. Gardner, P.C.
1150 Connecticut Avenue, N.W.
Suite 710
Washington, DC 20036

(Counsel for RSW Communications, Ltd.)

Robert M. Silber
National Captioning Institute, Inc.
5203 Leesburg Pike, Suite 1500
Falls Church, VA 22041

Vason P. Srini
Dataflow Systems
986 Cragmont Avenue
Berkeley, CA 94708

Tom W. Davidson
Paul S. Pien
Akin, Gump, Strauss, Hauer & Feld, L.L.P.
1333 New Hampshire Avenue, NW
Suite 400
Washington, DC 20036

(Counsel for Calling Communications Corporation)

EMI Communications Corporation
P.O. Box 4872
Syracuse, NY 13221

George Petrutsas
Paul J. Feldman
Fletcher, Heald & Hildreth
1300 North 17th Street
11th Floor
Rosslyn, VA 22209

(Counsel for Digital Microwave Corporation)

Albert Halprin
Stephen L. Goodman
Halprin, Temple & Goodman
Suite 1020, East Tower
1301 K Street, N.W.
Washington, DC 20005

(Counsel for Video/Phone Systems, Inc.)

Todd G. Gray
Kenneth D. Salomon
Dow, Lohnes & Albertson
1255 23rd Street, N.W.
Suite 500
Washington, DC 20037

(Counsel for Educational Parties)

Thomas A. Rose
Director Commercial Marketing
Microelectronics Division
M/A-COM, Inc.
1011 Pawtucket Boulevard
P.O. Box 3295
Lowell, MA 01853-3295

Linda K. Smith
Robert M. Halperin
William D. Wallace
Crowell & Moring
1001 Pennsylvania Avenue, NW
Washington, DC 20004-2505

and

Leslie A. Taylor
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, MD 20817-4302

(Counsel for Loral Qualcomm Satellite Services, Inc.)

Jon Schill
Vice President
Rio Vision, Incorporated
P.O. Box 1065
1800 East Highway 83
Weslaco, TX 78596

Frederick R. Guy
Guy Law Office
850 Fay Road
Syracuse, NY 13219

Roy J. Hebert
Alpha Industries, Inc.
651 Lowell Street
Methuen, MA 01844

Patrick J. Kerins
Alex. Brown & Sons, Inc.
P.O. Box 515
Baltimore, MD 21203

Jeffrey L. Sheldon
Thomas E. Goode
Utilities Telecommunications Council
1140 Connecticut Avenue, NW
Suite 1140
Washington, DC 20036

Robert M. Linz, PE
1820 Salem Court
Dunedin, FL 34698

Ron Milford
Technology Engineering Company
P.O. Box 671192
Dallas, TX 75367

S. Stanley Fischman
Managing Director
Baderwood International, Ltd.
P.O. Box 152
Rancocas, NJ 08073

Michael W. Thompson
Cardiff Broadcasting Group
2010 Jimmy Durante Blvd.
Suite 224
Del Mar, CA 92014

Charles T. Force
Associate Administrator for
Space Communications
NASA
600 Independence Ave., SW
Washington, DC 20024

John Haven Chapman
Chapman, Moran, Hubbard,
Glazer & Zimmerman
2000 L Street, NW
Suite 200
Washington, DC 20036

(Counsel for James L. Melcher; Video Communications Corporation; Harry A. Hall; Alliance Associates; Frederick M. Peyser; BMW Associates; R&R Telecommunication Partners; Steven A. Birnbaum; Robert E. LaBlanc; Joseph B. Buchwald; Jeanne P. Robertson; Celltell Communications Corporation; Sanford Robertson; Linda Chester; Robert Rosenkranz; Thomas Francis Clark; SMC Associates; Arnold Cornblatt; SCNY Communications, Inc.; CT Communications Corporation; Seaview Telesystems Partners; Evanston Transmission Company; Lewis W. Siegel; Judy Feinberg; Michael S. Siegel; Lawrence Fraiberg; Kathleen Smith; Freedom Technologies, Inc.; Rosalie Y. Goldberg; Charles D. Snelling; LDH International, Inc.; Telcom Investment Corp.; Paul Likins; Telecommunications/Haddock Investors; William R. Lonergan; Diane Wechsler; Herbert S. Meeker; Ivan Wolff; Norman Hascoe; Dr. Kim Sloan; Frederick M. Myers; P.M.J. Securities, Inc.)

Gary M. Epstein
Latham & Watkins
1001 Pennsylvania Avenue, NW
Washington, DC 20004

(Counsel for Hughes Space and Communications Company and Hughes Network Services, Inc.)

Pantelis Michalopoulos